

WHAT IS CLAIMED IS:

1. A laser marking method comprising:

starting illumination of a laser beam from a laser oscillator onto a light-photosensitive heat-developing photosensitive material having a surface layer including an emulsion layer is formed on a surface of a base layer;

forming a cavity at an interior of the surface layer by energy of the laser beam;

forming a convex portion as a dot on a surface of the light-photosensitive heat-developing photosensitive material by completing illumination of the laser beam at a point in time when a portion illuminated by the laser beam on the surface layer is deformed into a convex shape by a cavity formed in an interior portion of the surface layer; and

forming a predetermined marking pattern by the dot or an arrangement of the dots.

2. The laser marking method of claim 1, further comprising completing illumination of the laser beam when a projecting height of the convex portion which forms the dot, with respect to a top surface of the surface layer, is 10 μ m or more.

3. The laser marking method of claim 1, further comprising using an X-ray film as the light-photosensitive heat-developing

photosensitive material.

4. The laser marking method of claim 1, further comprising controlling an oscillation output of the laser oscillator and an illumination time of the laser beam.

5. The laser marking method of claim 2, further comprising completing illumination of the laser beam when the projecting height of the convex portion which forms the dot, with respect to the top surface of the surface layer, is in a range of 10 μm or more and 50 μm or less.

6. The laser marking method of claim 3, wherein the step of forming the predetermined marking pattern includes, in a case in which the X-ray film is to be cut along a longitudinal direction and worked into one of a state of a narrow roll and a state of a narrow sheet, forming a cut line by cutting, and forming the marking pattern to have top-bottom symmetry at both sides of the cut line.

7. The laser marking method of claim 4, wherein controlling the oscillation output and the illumination time of the laser beam includes a step of using a laser oscillator whose oscillation output is 100 W and whose oscillation wavelength is in a 9 μm band, and setting the illumination time of the laser beam to be in a range of 25 μsec to 35 μsec .

8. The laser marking method of claim 5, further comprising making an outer diameter of the dot be around 100 μm .

9. The laser marking method of claim 6, further comprising making respective diameters of the dots substantially uniform, and holding a conveying speed of the X-ray film substantially constant.

10. The laser marking method of claim 8, further comprising making the outer diameter of the dot be a value greater than 100 μm .

11. A laser marking method of forming, on a photosensitive material, a marking pattern of one of characters, symbols, and a character array in which one of characters and symbols are continuous, by an arrangement of dots formed by illuminating laser light, which is oscillated by a laser oscillator, while conveying the photosensitive material, said method comprising:

starting oscillation of the laser light by the laser oscillator before illumination of the laser light onto the photosensitive material; and

after an oscillation output of the laser oscillator is stabilized, forming the marking pattern on the photosensitive material by illuminating the laser light onto the photosensitive material while deflecting the laser light by a deflector in

accordance with the marking pattern.

12. The laser marking method of claim 11, further comprising stopping oscillation of the laser light by the laser oscillator after a predetermined period of time has elapsed from stoppage of conveying of the photosensitive material.

13. The laser marking method of claim 11, further comprising using an X-ray film as the photosensitive material.

14. A laser marking method of forming, on a photosensitive material, a marking pattern of one of characters, symbols, and a character array in which one of characters and symbols are continuous, by an arrangement of dots formed by illuminating laser light, which is oscillated by a laser oscillator, while conveying the photosensitive material, said method comprising:

starting conveying of the photosensitive material at a predetermined timing after starting oscillation of the laser light by the laser oscillator; and

forming the marking pattern on the photosensitive material by illuminating the laser light onto the photosensitive material while deflecting the laser light by a deflector in accordance with the marking pattern.

15. The laser marking method of claim 14, wherein the timing for

starting conveying of the photosensitive material is a time until output of the laser light, which is oscillated by the laser oscillator, is stable.

16. The laser marking method of claim 14, wherein the timing for starting conveying of the photosensitive material is a time when output of the laser light, which is oscillated by the laser oscillator, is stable, before a predetermined position of the photosensitive material reaches an illumination position of the laser light.

17. The laser marking method of claim 14, wherein the timing for starting conveying of the photosensitive material is a time set in advance on the basis of changes in output of the laser oscillator.

18. The laser marking method of claim 14, further comprising detecting the laser light oscillated by the laser oscillator, and judging the timing for starting conveying of the photosensitive material on the basis of results of detection.

19. The laser marking method of claim 14, further comprising using an X-ray film as the photosensitive material.

20. The laser marking method of claim 18, further comprising

stopping oscillation of the laser light by the laser oscillator after a predetermined period of time has elapsed from stoppage of conveying of the photosensitive material.

21. A laser marking method comprising:

starting illumination of a laser beam from a laser oscillator whose oscillation wavelength is in a 9 μm band onto a light-photosensitive heat-developing photosensitive material having a surface layer including an emulsion layer is formed on a surface of a base layer;

forming a cavity at an interior of the surface layer by energy of the laser beam;

forming a convex portion as a dot on a surface of the light-photosensitive heat-developing photosensitive material by completing illumination of the laser beam at a point in time when a portion illuminated by the laser beam on the surface layer is deformed into a convex shape by a cavity formed in an interior portion of the surface layer;

forming a predetermined marking pattern by the dot or an arrangement of the dots; and

controlling an oscillation output of the laser oscillator and an illumination time of the laser beam.